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Stanley's Hydraulic Main.

BROOKLYN, November 25, 1867.

EDITORS AMERICAN GAS-LIGHT JOURNAL:

Gentlemen: As the communication from Messrs. Herring & Floyd, published in the last issue of your Journal, is calculated to convey a wrong impression regarding my patent hydraulic main, I deign to say a few words in reply, and that my improvement may be fully understood, and its advantages appreciated, I have caused the accompanying illustrations to be made.

Fig. 1 shows a hydraulic main, fourteen inches wide inside, with its dip-pipe seven inches in diameter outside, extending downward through the centre, leaving a space of three and a half inches only on each side of the dip-pipe for the passage of the gas as it rises above the fluid. Mains of this size and form are in use in many of the gas works in this vicinity, while the position of dip-pipe as here shown, is the same as were in use in all gas works throughout the world, prior to my invention, which consists in dispensing with the dip pipe and causing the gas to enter the main at the side, the seal being effected by passing the gas through the fluid from A to B, as shown by figs. 2 and 3.

It will be seen that figs. 1 and 2 represent a main of the same size; fig. 1 showing the old arrangement and fig. 2 my improvement, with double the capacity of fig. 1, without adding to its weight.

Fig. 3 shows my improvement, with a new arrangement of stand and bridge-pipe combined; but like the bridge-pipes before illustrated in connection with my main, they form no part of my patent. I have only made use of them to economise in the weight of castings, leaving it with those who adopt my improvement to use such connecting pipes, as in their judgment seem best.

In regard to "priority of invention" I will say a few words. Messrs. Herring & Floyd says:

"During the *past summer*, in order to meet the wishes of some of our customers who desired to economise in the weight of castings, appertaining to the setting of retorts, *we devised* a new arrangement for connecting the stand-pipe to the hydraulic main, dispensing altogether with the dip-pipe and diminishing the length of the bridge-pipe, by introducing the gas directly on the face side instead of on the top of the main, as has always been practiced before, etc., etc."

When I consider that my improvement has been in use about a year and a half, and its advantages acknowledged by some of the best engineers, both in this country and in Europe, besides being illustrated in this Journal in July, 1866, it would seem not a very difficult matter to settle the question of priority of invention, without even "awaiting the action of the Patent Office."

An attempt to evade a patent is one of the best evidence of its importance, and it is not expected that mine will escape; and I have only to say in conclusion, that if Messrs. Herring & Floyd, in their arrangement, have *dispensed* with the *dip pipe as heretofore used*, and cause the gas to enter the main at the *side*, they are making use of what I have already patented. Whether they have, or have not done this, I leave to your readers to judge.

I am, very truly, yours,

I. N. STANLEY.

Fig 1.

Fig. 2.

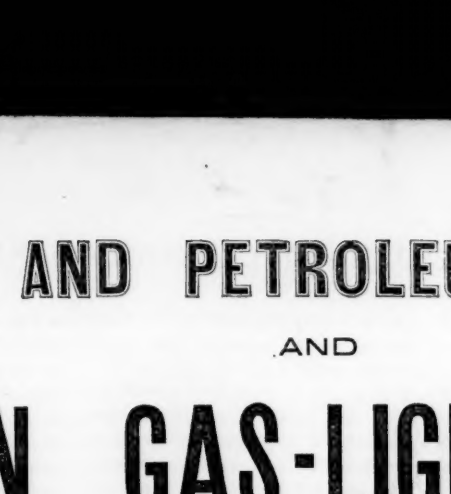

Fig. 3.

STANLEY'S HYDRAULIC MAIN.

Cheap Manufacture of Oxygen.

[From the Mechanics' Magazine.]

Few things would have more important results in chemical technology than the cheap manufacture of oxygen gas We have always kept our readers informed of the various methods proposed for attaining this desirable object; and we mentioned several months ago the process of MM. Tessie du Motay and Marechal. Having seen the operation in progress, we are now able to speak of its actual results. Arrangements are being made at the Hotel de Ville, at Paris, for the supply of oxygen as a substitute for atmospheric air, to the gas burners used for illumination throughout the building. The generators and gasometers are already placed in the cellars; and it has been ascertained that the employment of oxygen causes the brilliancy of the light to be eight or ten times greater. The oxygen, it will be remembered, is derived from the decomposition of manganate of soda; and the apparatus for effecting this is simple and not expensive. In the first place, there is a boiler in which steam is generated at a moderate pressnre. The steam is then passed through an ordinary super-heater, a worm set in a furnace. From this it passes into a retort in which the manganate of soda is kept at a dull red heat. Here the decomposition is effected, and the steam and oxygen pass on to a refrigerator in which the steam is condensed, while the oxygen passes on to a gasholder. When the evolution of oxygen ceases the steam is shut off, and a current of atmospheric air is passed through the retort by which the manganate of soda is regenerated. Thus the operator starts with a charge of manganate (1 cwt. to the experiments under description) which never wants renewal. The charge of manganate in actual use, after over 80 re-oxydations, yields about 100 gallons of oxygen per hour, the cost of which is mainly the cost of the fuel consumed. A little carbonic acid is disengaged with the oxygen, but it has not been found necessary to separate this.

One useful application of oxygen is shown at the same spot in a modification of the Drummond light. A mixture of oxygen and coal gas is burned, and a flame is made to impinge on a cylinder of magnesia, agglomerated bychloride of magnesium by the process of M..Carlevaris. These cylinders are very compact and lasting, and are the very best we have seen produced for similar purposes. The light given, we need hardly say, is very intense, and the method promises to receive extensive applications in Paris.

Purification of Gas.

[From "Clegg on the Manufacture of Coal Gas."]

The gas, after it has passed through toe condensers and exhausters, must be purified, as much as is practicable, from the sulphuretted hydrogen, the carbonic acid, the ammonia, and from the tarry vapor that still remains in excess. The hydrate of lime was first used for that purpose by Mr. Clegg, in 1805, and though numerous other substances have since been tried. there is nothing which so completely effects the object of purification as lime. That substance also possesses the advantage of being cheap; and were there no other considerations requiring attention than the purification of the gas by the best and cheapest means, lime would, no doubt, be generally adopted in preference to all other substances. But when the manufacture of gas has to be conducted in populous districts, the avoidance of nuisance is obliged to be regarded, and the offensive smell that arises from the refuse lime, owing to the profuse liberation of ammonia and sulphuretted hydrogen, renders it necessary either to provide special means for its prevention, or to employ other materials for purification.

The substances that have been used as substitutes for lime are metallic oxides, the sulphates and muriates of manganese, of iron, zinc and nickel; and in some instances the salts of lead, bismuth, copper, tin and antimony have been employed; but the great cost of the latter renders them practically inapplicable. These metallic salts remove the sulphuretted hydrogen and ammonia, but they have no affinity for the carbonic acid contained in the gas, therefore it is necessary to pass the gas through lime to absorb that impurity; either after the sulphuretted hydrogen and ammonia have been removed by other agents, or in combination with them.

The process of purification is so important in the manufacture of gas, that it is essential the chemical principles on which it depends should be well understood, so that the gas manufacturer may be able to apply to the best advantage the means he has at command for effectuelly removing impurities from the gas without injuring its illuminating property. In an article contributed by Dr. Franklin and Dr. Attfield, the various products from the distillation of coal are fully noticed, and the general characters and chemical affinities of the substances obtained are clearly explained; and from a knowledge of the constituents of crude coal-gas, and of their respective affinities, the means may be inferred, theoretically, of removing those portions which tend to diminish the luminosity of flame, or render combustion offensive and injurious. But theory and practical application are so frequently at variance in conducting operations on a large scale, that no reliance can be placed on theory alone. Its principal value consists in warning the experimenter and the gas manufacturer against the adoption of processes based on erroneous principles. This negative knowledge is, however, of great importance, and from the absence of it much time and money have been squandered on endeavors to purify gas by means which were physically impossible.

Taking impure coal-gas as it issues from the condenser, the impurities requiring removal will be found to consist of ammonia, sulphuretted hydrogen, and carbonic acid, in proportions which, when common Newcastle coal has been employed for distillation, may be taken at 1½ part of ammonia, 8 parts of sulphuretted hydrogen, and 25 parts of carbonic acid in every 1000 measures of the gas. From this it appears that the quantity of ammonia present is not nearly equal to the saturation of the sulphuretted hydrogen, and still less, therefore, to that of the carbonic acid also. Hence it is found that neutral metallic salts, such as the sulphate of iron, do not remove the whole of the sulphuretted hydrogen; nor neutral earthy salts, such as the muriate of lime, the whole of the carbonic acid. One great cause of the difficulty of purification, therefore, arises from the deficiency of ammonia, and not from its excess; for that necessitates the employment of some other alkali or alkaline earth, of which lime is the cheapest.

Common lime, used in a dry-lime purifier, is the most effectual, the most economical, and the least hurtful agent by which the impurities in coal-gas can be removed; and next to it may be classed lime used in a wet purifier, though the latter is much less effective, and is apt to leave carbonic acid in the gas. Of course this goes no further than to the absorption of the acidulous compounds contained in the gas, such as carbonic acid and sulphuretted hydrogen. But something may be learned, nevertheless, from ths peculiar fitness of lime even in respect to the removal of the alkaline compounds. Neither carbonate of lime nor the hydro-sulphate of lime possess any affinity for those naphtha vapors or hydrocarbons on which the luminosity of gas depends. Hence the lime, when fully saturated with carbonic acid and sulphuretted hydrogen, absorbs none of the light-giving principles of coal-gas, which pass on untouched. A very different result, however, takes place with the oxides, carbonates, and sulphurets of the metals.

Though the ammonia cannot be removed by hydrated lime, the salts of that earth possess the property of absorbing it from the gas; and as lime causes the least absorption of illuminating matter, it follows that the salts of lime are on that account better adapted than any other substance for the removal of the alkaline or ammoniacal impurities from coal-gas. It may, indeed, be taken as a generally admitted fact, that when any of the salts of lime, such as the nitrate, sulphate, or muriate, are so placed that the current of impure gas may first pass through or upon them, and afterwards traverse the filled compartments of a dry-lime purifier then the greatest known perfection of coal-gas purification is obtained. Of these salts the dry sulphate of lime is the only one not included in any valid patent in this country, though it constitutes the basis of a very important patented invention much used in France, the result being, under favorable circumstances, a valuable manure.

The muriate of lime is superior in activity to the sulphate, and the mode of using it for the purification of coal gas, as patented by Mr. Laming, possesses great advantages. But whatever the plan adopted, the theory and practice of the application of the salts of lime are equally satisfactory. The ammonia combined with carbonic acid is arrested by the lime salts, and a double decomposition ensues, attended with the production of two new substances, neither of which has any affinity for the illuminating matters of the gas. The nature of this decomposition may be very easily shown. Thus, if we suppose muriate of lime to have been employed, we shall have—

$$\text{In the gas } \left\{\begin{matrix}\text{Carbonic acid}\\ \text{Lime}\end{matrix}\right\} \text{ for the purifying substances,}$$

which, by simple interchange of elements, will form muriate of ammonia and carbonate of lime—two salts devoid of action upon every form of hydro-carbon.

Foul lime, as it is removed from the purifier, consists of an admixture of several salts. Those only that need to be practically considered are the carbonate and hydro-sulphate of ammonia, which constitute an important part of the total bulk. The analysis of these principal compounds shows that more than half the mass consists of carbonate of lime, nearly one-fourth of hydro-sulphate of lime, about one-fifth is hydrate of lime unacted on, and the residue contains the cyanogen salts, and the siliceous and other impurities of the limestone, with a variable proportion of hydro-sulphate of ammonia retained in the mass mechanically. With such a mixture it is not surprising that an offensive odor is emitted on exposure to the atmosphere; for, in the first place, the hydro-sulphate of ammonia must pass into the air by a simple process of diffusion, whilst the hydro-sulphate of lime, being acted on by the carbonic acid of the atmosphere, will give rise to the formation of carbonate of lime and a copious evolution of sulphuretted hydrogen gas. It is in the prevention of this evolution of sulphuretted hydrogen that the process of purification by oxide of iron owes its chief recommendation; for the affinity of oxide of iron for sulphuretted hydrogen is greater than for carbonic acid. Hence the sulphuret of iron when removed frem the purifiers and exposed to the air emits no odor, whilst the sulphuret of lime is readily decomposed and produces an abominable smell.

The analysis of impure gas-lime depends upon very simple chemical properties. The hydrate of lime and the sulphuret of calcium are readily soluble in a solution of muriate of ammonia slightly warmed; but the carbonate of lime is not soluble, to an appreciable degree, in that menstruum. If therefore we weigh 100 grains of the impure lime, and digest it with a solution of muriate of ammonia in a closed vessel for a few minutes at a temperature of 70° Fahr., we dissolve the hydrate of lime and sulphuret of calcium, but leave the carbonate of lime at the bottom. If we then pour into the clear solution a quantity of muriate of copper, previously supersaturated with ammonia, a black precipitate will form, and this collected in a filter and washed, first with diluted vinegar, then with water, and lastly dried at a heat of not less than 212°, the weight of it, when divided by three, will show the amount of sulphur present in the lime; and since 16 of sulphur represent 28 of lime, the weight of the last combined with the sulphur is easily estimated by multiplying the amount of sulphur by 7, and dividing by 4. To the clear blue fluid which has passed the filter a quantity of carbonate of ammonia must be added, and the white precipitate thus formed should be allowed to settle for a few minutes, when it must be thrown upon a filter and washed, first with a solution of ammonia, and lastly with water, after which it must be dried at a heat a little above that of boiling water, and then weighed. Every 50 grains of this precipitate represent 28 of lime; and if from the weight thus formed we deduct the amount of lime which was combined with the sulphur, the remainder shows the total quantity of lime wasted or at least not used, in the process of purification. This ought never to exceed one-fourth of the whole; and when there is sufficient purifying surface, one-fifth is an abundant allowance.

(To be continued.)

Brevities.

—An essence that yields most—Aquiescence.

—The Harlem bridge cost nearly $7,000,000.

—A Mississippi chemist is said to have discovered a method of manufacturing a golden fluid for writing.

—Two hundred and fifty oil wells are now being drilled in Pennsylvania.

—The new bridge over the Susquehanna at Harrisburgh, Pa., is finished.

—Petro oil, a non-explosive oil, giving a beautiful light, is a new discovery used in the West.

—Lead pipes are to be used for gas conductors on the public buildings in Chicago.

—Valuable pearls have been found in muscle shells, in the Miami river, Ohio.

—The New Haven *Palladium* denies the rumor that the Faculty of Yale college contemplates disbanding.

—The circulation of *Harper's Magazine* is now 115,000; that of the *Weekly* is from 85,000 to 90,000.

—Pennsylvania can supply 20,000 tons of coal per annum for 500 years.

—The double track of the Pennsylvania Central railroad has been completed all the way from Philadelphia to Pittsburgh.

—Over one hundred and two thousand bushels of corn have been distributed among the poor of 58 counties in Georgia.

—A tunnel is to be cut under the Mersey river between Birkenhead and Liverpool. It will cost five million of dollars.

—Milwaukee will have a skating rink this winter two hundred and twenty feet by one hundred feet, and forty feet high.

—M. De Lesseps states that the new Suez canal loan has been subscribed, and that the water route to India will be completed in 1870.

—The new track on the Hudson River Railroad of steel rails is completed from New York to Yonkers, and is to be extended to Sing Sing.

—San Francisco is about to have a general Labor Exchange, a citizen of that place having given $60,000 to endow such an institution.

The History of Illuminating Gas.

[Concluded from page 147.]

The annual consumption was calculated to be two thousand five hundred cubic feet per day, requiring each day seven hundred-weight of the best Wigan coal. The annual consumption of coal would be one hundred and ten tons, and cost one hundred and twenty-five pounds, less the sale of coke at one shilling and four pence the hundred-weight. This does not include the sale of one thousand two hundred and fifty gallons of tar annually produced from coal.

Allowing for interest of capital sunk, wear and tear Mr. Lee calculated his annual payment for gas at abou six hundred pounds. The cost of candles would have been about two thousand pounds annually. If lights were burnt three hours a day throughout the year instead of two, Mr. Murdoch calculated the cost of gas at six hundred and fifty pounds, and tallow candles at five thousand pounds. Mr. Lee stated before a committee of the House of Commons in May, 1809, that half a cubic foot of gas produced in one hour more light than one hundred and seventy-five grains of a six to the pound candle.

In 1809, Mr. Samuel Clegg received a silver meda[l] from the Society of Arts for improvements in gas apparatus for factories. In this same year Winsor and his Pall Mall patrons applied to Parliament for an act to incorporate a company. This was the origin of the London and Westminster Chartered Gas Company. The capital proposed to be raised was two hundred thousand pounds. Mr. Murdoch opposed them warmly, and claimed priority of invention. Sir Humphry Davy and James Watt were examined. Both the applications failed, owing chiefly to the prejudice against Winsor and the horrible scalping given to Mr. Accum, one of the directors, by Mr. Brougham, who ridiculed his mathematics, exposed his science, and disproved his arithmetic. Brougham, like Sir Walter Scott, laughed gas-lighting to scorn. Whether he ever proved his conversion by helping to start a new gas company, as Sir Walter did, we do not know.

But nothing could tire out Winsor. In 1810, another application was made to Parliament; and, though his friends encountered some opposition, and incurred considerable expense, he succeeded in obtaining an act to authorize a royal charter, within three years from the time of the passing of the act. But the bill as originally introduced, was materially altered, and certain conditions were imposed which limited the company's powers to London, Westminster, Southwark, and the suburbs adjacent. Besides, it was stipulated, that, if required, they should contract with the parishes of London, Westminster, and Southwark, to furnish a stronger and better light, and at a cheaper and lower price, all expenses included, than such parishes could be supplied with oil, if lighted in the usual manner. Their capital was limited to two hundred thousand pounds, which was to be raised in shares of fifty pounds each.

All the first attempts at gas-lighting by the persons who afterwards formed the Chartered Gas Company, were made in Pall Mall. But after they became a legalized body, they purchased the lease of a large wharf and premises in Canon Row, Westminster; however they found the place inconvenient, and were afterwards obliged to abandon it. Their experiments at this place were very expensive and absorbed nearly the whole of their first deposits of ten pounds per share on the four thousand of which the company existed.

After having expended so much with Winsor, and the first deposits being exhausted, with little apparent effect, the proprietors became dissatisfied; but although their labors had been attended with no profit, and with very little fame, they steadily pursued their plans, and made the necessary purchases for their different stations. They first obtained that in Peter street, Westminster, afterwards that in Curtain Road, and lastly that in Brick Lane.

Still the company went on in full belief of their own principles, and laying down boldly the great central mains that were certain soon to be required. In 1813 hey appointed Mr. Samuel Clegg as their engineer, and under his efforts daylight began slowly to dawn. Yet still the ten pound shares would only sell for two, and the cry was for more and more money. Mr. Clegg's experiments were not always at first successful. The mains he laid down were too small. In 1813 the terrorists and conservative croakers were delighted by an explosion happening in the Westminster Gas Works, which knocked down two nine-inch walls, scorched Mr Clegg's hair, and blew off his hat. A committee of the Royal Society was appointed to inquire into this accident, and the report of that body gave confidence to the public, and led to improvement in gas apparatus.

Gas now flamed up brighter. The City of London Company was started, and two others projected. In 1816 the old company applied for power to augment their capital by two hundred thousand pounds more. This they obtained under restrictions from the Home Department. Soon after, Mr. Clegg, inventor of the gas meter, encouraged customers and helped to preserve gas companies from fraud. Great prejudice against gas, however, still continued. On the debate on the gas bill, June 11, 1816, the tone of the enlightened House was against the certain injury it would do to the whale fisheries, one of the great nurseries of the British navy. Alderman Atkins complained of the exclusive privileges claimed by this bill, and that the measure was likely to ruin the hardy race of men employed in the southern and Greenland whale fisheries, n each of which a million of money and above one hundred ships were employed. If the bill were passed, it would throw out of employment ten thousand seamen, and above ten thousand rope-makers, sail-makers, mast-makers, etc., connected with that trade.

In the House of Lords, the danger of gas monopoly, now so bitterly felt in London, was clearly seen. The Earl of Harrowby observed that although the bill did not in terms give a monopoly, yet the effect of it, by giving the means of raising an additional capital of two hundred thousand pounds, would be in all probability to enable the company to destroy competition, and secure to themselves a monopoly. He did not make this objection with a view to the whale fisheries, admitting that they ought not to stand in the way of improvements in science, but with a view to this beautiful and excellent light itself, which was now furnished in different quarters of the town by private companies, and this corporation would, by this bill, possess the means of extinguishing those private companies, and securing to themselves a monopoly.

In 1814, when the Royal Society visited the London Gas Works, there was only one gasometer, holding fourteen thousand cubic feet of gas. When Sir William Congreve reported on them in 1822, the Peter street Station alone was producing annually one hundred and eleven million three hundred and eighty-four thousand cubic feet of gas. There were annually used in London three hundred and ninety-seven million cubic feet, lighting sixty-one thousand two hundred and five private and seven thousand two hundred and sixty-eight street lamps. This did not include several private companies. Yet gas was still so little used in the poorer districts, that in the Whitechapel works two large *canvas bags* were used as gasometers.

In 1827, the number of public gas companies in the United Kingdom amounted to two hundred. The young giant grew fast. The gas pipes in and around London now extend upwards of two thousand miles.

A Gigantic Casting.—Messrs. Rowan & Sons, York street, Belfast, lately made a successful casting of a fly wheel 24 feet in diameter, weighing upward of 18½ tons, and one of the most ponderous articles that have been produced in that country. The rapidity with which the whole work was done was surprising, seventeen tons of metal being melted in the space of two hours. The work was effected by means of three ladles, containing respectively eight, six, and three tuns, which were raised by a crane, and guided by a number of the men. So closely were the calculations made that the surplus metal only weighed a few pounds.—*Scientific American.*

Baltimore Water Supply.

REPORT OF SURVEY OF THE GREAT GUNPOWDER RIVER.

[From the Baltimore Sun.]

The late City Council purchased the water rights of the Great Gunpowder River for the sum of $565,000, with the view of increasing the present supply to Baltimore of water. The purchase includes the water rights of the entire stream, from tidewater to Meredeth's bridge, a distance of twenty-one miles, with 1,600 acres of land; the bed of a lake river, with a margin of 100 feet; the Hollingsworth Copper Works, Joppa Mills and the Patterson Nail Factory. The chief engineer, Mr. H. M. Stamp, who was employed by the committee of the Councils, has submitted his report, upon which the following statement is based:

His duty was to examine every line by which water could be conveyed into the city by natural flow at the least expense and in the purest condition. The maximum surface of the Gunpowder lake is 172 feet above tide, surface area 231 acres, maximum depth 31 feet, minimum depth 15 feet, capacity 600,000,000 gallons. The head of this lake is to be grubbed and excavated to a depth of 15 feet, or to the rock, if reached before that depth. The dam of the lake is 386 feet in length at the crown; height above the foundation 31 feet, and length for overfall 200 feet. The foundation of the dam will rest upon solid rock, and it will be constructed of heavy cut stone blocks. The water is proposed to be conveyed through Mine Bank run conduit, in length one mile and 1,337 feet; Suter's Ridge tunnel, four miles in length; Herring Run conduit, 3,688 feet, and Tiffany's tunnel, 1,030 feet.

To these tunnels will be seven shafts of the following depth below surface ground: No. 1, 203 feet; No. 2, 242 feet; No. 3, 232 feet; No. 4, 230 feet; No. 5, 172 feet; No. 6, 86 feet, and No. 7, 90 feet. These will be alongside the tunnel, so as not to endanger the laborers in the tunnel in cases of accident, especially with the hoisting machines. The shafts of the tunnel will be carried up 15 feet above the ground, which will give the tunnel a current of pure air, and they may be used by the officers of the water department when examining the condition of the tunnel, and for laborers in case of accident. The length of the entire line will be six miles and 4,901 feet. The engineer is fully convinced that, at the assumed rate of one cent. per thousand gallons, the water will find ready consumers for manufacturing purposes. The rates of London are nearly double, and in Boston nearly five times the price estimated. There are two estimates made—one with a daily capacity of 200,000,000 of gallons, which would cost $2,412,845, and the other for 150,000,000 gallons at a cost of $2,143,162. The engineer recommends the latter for the reason that the city will not need more than the latter supply, besides that from the Swann Lake aqueduct, for more than a half century to come.

Speaking of the open canal line, as reported by Henry Tyson, Esq., consulting engineer, he says that, whilst the canal for purposes of navigation would prove a source of revenue to the city, yet it must have its southern terminus at the distributing reservoir, a distance of more than a mile from the northern boundary of the city, which would involve additional cost of transportation in wagons of freight brought through it. The other objections to a canal are the exposure of the water to filth and the heat of the sun, its waste by evaporation, its additional cost of one and a half millions of dollars, its expense from washing, its greater cost of superintendence, and the purer condition and cooler temperature of the water from a tunnel.

Chloride of Magnesium.—It has been announced that chloride of magnesium can unite and associate with magnesia, forming an oxychloride of magnesium, perfectly insoluble, and possessing the property of taking all variety of forms in a degree incomparably greater than plaster of Paris. It is also capable of taking a high polish of a great number of substances with which it may be mixed in the proportion of a fifteenth to a twentieth of their weight. The same is sold for meerschaum pipes.

Correspondence.

Stopping Up of Service Pipes.

LOUISVILLE, KY., August 31, 1867.

EDITORS AMREICAN GAS LIGHT JOURNAL:

Gentlemen: With your permission I would like to make same statements in regard to a very serious trouble we meet with, and enquire if any of your numerous readers have met with anything of the kind, and if so, how they remedied it.

For the last three years, during the latter part of Summer and beginning of Fall, we found many of our service pipes entirely stopped with (I suppose) naphaline; none are entirely free from it. In many instances we find it necessary to clear the service every week, which we do by forcing boiling water through the pipe into the street main; this, however, is only a temporary relief, as in some instances I have known it to re-form in three days, and to entirely stop the flow of gas through an inch-pipe. In appearance it very much resembles gum camphor, but melts readily with the warmth of the hand, or at a temperature of 80° Fahr., passing off into the air, leaving the hand entirely dry, with, perhaps, the slightest trace of oil. We are now, and have always used the best article of Pennsylvania coal. Our works are supposed to be as complete as any in the country, especially in the purifying department.

I hope to hear from the gas men in regard to this matter. If agreeable to you, and interesting to your readers, I will, at some future time, give you a description of our works, and mode of working.

Respectfully,

BENJAMIN RANKIN,
Inspector Louisville Gas Co.

[We trust some of our readers will help the above correspondent out of his difficulty. We will willingly publish any plan proposed.

We will be glad to have the description of the works, and hope others may also favor us with descriptions of their works, improvements, alterations, etc.—EDS.]

Pithole Oil Field.

[From the Pithole Record.]

The oil territory around Pithol is as yet but partially developed. Because the day of flowing wells is past, which is not only the case here, but is so all over the oil region, people outside put on a wise look, wag their heads knowingly, and say "Pithole has run dry, &c., "and the entire oil region is played out." Such remarks are generally made by persons who have never been in the oil country and know nothing whatever of what is going on here in the business of oil mining, except from an occasional item that finds its way into the newspapers of the surrounding country. Could such persons take a journey through the region at the present time, and see the amount of business carried on, we imagine that their opinions would change amazingly. The business has came into the hands of men who thoroughly understand it in all its branches, and know just what to do, the consequence being that good wells are got, and more than double the amount of money invested in developing the territory is made.

The price of oil has fallen somewhat, being now held by the producers at $3 20, while the buyers offer $3.10, not many sales being made. In the event of a "rise" in the Alleghany river, which the operators are anxiously waiting for, to allow the surplus oil to get out of the region, the price of oil will have to advance.

Below will be found the condition of the several wells which we visited on Saturday, Nov. 2.

T. HOLMDEN FARM.

No. 49 has been started up again and was making a good show, gassing freely. No. 242 is holding out as well as ever, doing about 60 barrels per day. No. 246 was not doing so well, on account of being troubled with water. Is yielding about 40 barrels per day. No. 241—30 barrels. No. 248—35 barrels. No. 245—40 barrels. A new well is to be put down on this lease. No. 247 was doing as well as ever, pumping nearly 50 barrels per day. No. 1, lease 250, 10 barrels per day. No. 2, same, 55 barrels. No. 249 has been shut down. No. 252—20 barrels. The Grant well—25 barrels. No. 46—30 barrels. Other wells remain in about the same condition.

ROOKER FARM.

On the Empire Oil & Mining Co.'s tract, several accidents have occurred to the wells during the past week. In No. 190 a working-barrel was lost, and in endeavoring to get it out the sucker-rods were lost. They will be taken out soon. Several other wells on this tract were shut down temporarily on account of accidents. No. 190 on this tract will be tested this week. The Bonta well is doing 40 barrels per day. No. 200—20 barrels. At least four drilling wells on this farm are nearly completed. Pipe was being driven for a new well on lease 189. No. 195 is doing 30 barrels per day. Several pumping wells are doing the same as last reported. One or two new oil tanks are being put up on this farm.

HINER FARM.

On the Marine Company's tract, from Captain Tomlinson, superintendent, we learn that matters are progressing favorably. No. 20, on this tract, was to have commenced testing on Saturday morning, but unfortunately a round rimmer was lost on Friday night. Efforts are now being made to get it out. On the Lockwood and Fort Pitt Company's tract, nothing new has transpired.

Purification of Water.

The London *Builder* says that Mr. Thomas Spencer, the discoverer of electrotype, has made another important discovery. He has ascertained that the magnetic oxide of iron which abounds in rocky strata and in sands, etc., attracts oxygen, whether it exists in water or in air, and polarizes it; that this polarized oxygen is the salubrifying ozone; that this ozone, so formed, destroys all discoloring and polluting organic solutions in water, and converts them into the sparkling and refreshing carbonic acid of the healthful spring. It is claimed that even sewerage water can be thus almost instantaneously purified.

Moreover, Mr. Spencer has discovered that the apparently mechanical process of filtration is itself magnetical, and it is now known thas all substances are constitutionally more or less subject to magnetical influence; thus all extraneous matters suspended in water may be rapidly attracted in filtration, and so separated: and this may be done whether on a great scale or a small, either by the magnetic oxide or black sand of iron, by a mixture of this with ordinary sand, or by various other means; and Mr. Spencer has discovered a solid porous combination of carbon with magnetic oxide, prepared from Cumberland hæmatite. which is said to have very great filtering power.

Mr. Booth, of Birmingham, England, has also recently promulgated a process for purifying water, for which meritorious claims are also put forth, and which may be very properly introduced in this connection. He placed in the water a neutral solution of bisulphate of alumnia, in the proportion of one ounce to 435 gallons. The sulphuric acid of the sulphate decomposes the bicarbonate of lime in the water, and forms an insoluble sulphate of lime instead. The hydrate of alumnia being set free, forms with the organic matter in the water another insoluble compound. Both these fall to the bottom, and the remaining freed element, carbonic acid, lends an agreeable quality to the water.

—It is found that if beans are watered with a solution of sulphate of iron, they will grow to double the ordinary size, and acquire a much better taste. A like effect is produced in the case of other vegetables. Water kept in a tub with a quantity of old nails in it has been found beneficial for watering purposes.

—The Omaha *Republican* says that the great Pennsylvania Central Railroad, which was heavily interested in the Kansas Pacific Railroad, has withdrawn all its interest from it, and transferred it to the Mississippi and Missouri Railroad, through which to make connection with the Platte River route.

General Summary.

SCHOOL OF MINES.—At the coming session of Congress the establishment of a National School of Mines is to be proposed. It is estimated that $10,000,000 per annum may be saved by the adoption of a better system in the working of our ores.

THE AGE OF INVENTION.—It appears from the records of the Patent Office, that in 1864 the number of applications for patents was 6000; in the following year it increased full fifty per cent; in 1866 15,000 applications were filed, and this year it will probably increase to 25,000. The number of caveats filed last year was twenty-seven hundred, and this year there will be upwards of four thousand.

THE SIERRA TUNNELLED.—The east end of the Summit tunnel is open and daylight shines through its entire length. In a few weeks the bottom will be cleaned out and the track laid. Many predicted it would require three years to accomplish what has been done in one. The first locomotive east of the Sierras is now in running order. and will immediately commence the work of track-laying. Twenty-five miles of road-bed is ready for the superstructure.

HIGH-PRESSURE STEAM ENGINE.—The largest high-pressure steam engine ever built in this country, was exhibited in Brooklyn recently. The frame is a hollow tower of cast-iron weighing 33,000 lbs. On the top of this is the cylinder, 46 inches in diameter by 40 in length, weighing 10,000 lbs. This cylinder is calculated for 1,200 horse-power at half stroke, or 2,000 at full stroke. When the engine is in operation, the principal bearings are covered with cold water from a pipe which runs through the crank and turns with it by an elbow. This monster engine is intenden for Messrs. Cooper & Hewitt's rolling mills at Trenton, N. J., with which they hope to roll iron beams forty feet long and twenty inches wide.

MACHINE FOR PROVING GAS-PIPES.—It is customary in the introduction of gas into buildings, before letting on the gas, to test the pipes and their connections as to their tightness or freedom from leakage, which is usually done by pumping or compressing air into the pipes and allowing it to remain therein for a certain period of time, a mercurial column or guage being connected with the pipes, which the compressed air acting upon raises to a certain point, any depression or deviation from which, at the expiration of the time of proof, will show the amount, if any, of leakage, after which ether, or some other agent more subtle than air, and more or less odorous is introduced, to detect the precise place or places, and the amount of leakage.

This improvement obviates the use of a mercurial column or guage, which is in many respects objectionable, and embraces a novel arrangement of an ether-box and pressure diaphragm with indicator and check-valve, constituting an apparatus which may be readily attached and detached without liability to breakage or getting out of order, and will accurately test the tightness of the pipes. A. C. Beardslee, of Brooklyn, New York, is the patentee.

NEW APPARATUS FOR ILLUSTRATING WAVE MOTIONS.—Professor Lyman, of Yale College, has made an ingenious and simple apparatus, consisting of a white board about four feet long and three broad, in front of which and running lengthwise are two brass wires about one foot apart. Each is connected at short distances with a series of cranks by means of swivels. These cranks are connected behind the board by means of clockwork, so that all are set in motion by the revolution of one wheel; which is easily moved with one hand. The cranks are set at different angles to each other, and when put in action elevate or depress the wires, forming constantly varying curved lines, thus representing the form of water waves. The lower wires shows the comparative decrease of motion at a depth below the surface, having a fixed relation to the length of the wave. Professor Lyman proposes to simplify his apparatus by dispensing with the numerous toothed wheels, and substituting a simpler connection. When this is done its cost will not exceed $10 or $15.

Friendship.

I feel the more, the more I know,
That friendship is a thing apart,
A mute assurance of the heart,
A faith that little cares for show:

A sympathy of soul and soul,
Which feel themselves in spite of birth
And all the petty cares of earth,
Two halves of one eternal whole:

That asks no change, if undeceived,
And shuns to court the vulgar eye,
Contented in obscurity,
If it believes and be believed:

A lamp that needs but little oil,
But is with its own burning fed;
A virgin stream, that will not wed
Or mix itself with earthly soil:

A beauty that no tongue can tell,
That underlies our common dust,
As bright beneath the rough-ribbed crust,
Glistens the glory of the shell:

Felt in the pressure of a hand,
Though face and voice be stern the while;
Sent in the message of a smile,
That only two can understand.

Report of the Committee on Plastic Slate.

[From the New York Semi-Weekly Times, Nov. 15, 1867.]

AGRICULTURAL—NOTES AT THE FARMER'S CLUB.

On Tuesday, the 12th inst., the Club convened at the usual hour—1½ o'clock. N. C. Ely in the chair.

For nearly two years past the Club has received constant inquiries on the subject of Plastic Slate for covering buildings, and the accounts have been of such conflicting character, that the Club appointed a committee, consisting of P. T. Quinn, Isaac Hicks, Wm. L. Carpenter, S. Edwards Todd, and Solon Robinson, to inquire into and report facts in regard to the value of Plastic Slate for roofing and other purposes. This committee, individually and collectively, have honestly endeavored for several months past to ascertain the truth, and they made a report through Mr. Quinn, the chairman, to the effect that this kind of roofing is being employed to a large extent, and that it usually succeeds well and gives excellent satisfaction.

The report alludes to the fact that this kind of roofing is sometimes liable to crack when it is not properly put on; and, in some instances, complaint has been made that the effluvium arising from the coal-tar with which the flour is mixed is very disagreeable; and, in a few instances, complaint was entered against this roofing where the rain water is collected, as the coloring matter in the tar will color the water. This is the substance of the report, which is too lengthy for publication.

The report was accepted and the committee were discharged.

Solon Robinson.—Although there have been failures in making roofs of this material, they are all traceable to causes that do not militate in the least against the value of Plastic Slate, which indisputably does make a perfectly water-tight roof, and, what adds to its value, one that is actually fire-proof. I have the oldest roof in this vicinity upon part of my house in Westchester County. After more than two years' trial, I do not hesitate to say that I would not exchange it for any other known roofing material. I believe it should, and probably will, supersede all other materials. I believe no roof, properly made of this material, ever failed. In addition to what was stated in the report, the committee find that Plastic Slate is coming into use more rapidly than ever has before almost any other new article or invention. We find recent discoveries and improvements in the use of Plastic Slate exceedingly promising of benefit to the public. It has been used successfully to stop the tide out of cellars, where everything else had failed. It is now applied to felting, so as to make portable, ready roofing; and sheets of slate have been cheaply constructed, which are better than those from the quarry, because flexible. Experiments are now in progress which promises a light, cheap felt or roofing paper, fire and water-proof. Favorable reports have been made of the use of Plastic Slate upon the bottoms of ships instead of copper, as well as for protecting posts and building timbers from decay. It seems only to need time for men to learn how to handle this new material; and that every new invention has been subject to mistakes and failures; but these should not prevent people from enjoying a valuable discovery, and such we believe this to be, and recommend it accordingly.

S. Edwards Todd.—There are a few points not alluded to by the other members of the committee, which I will elucidate. As we desire to treat everything with the greatest possible fairness, we want to give the Plastic Slate roofing the full benefit of all its advantages. Hearing of so many failures, I have been exceedingly shy of this roofing, until I gave the subject a full and thorough investigation. I have examined numerous roofs, and my doubts are all removed. I believe that if the tar and the flour are united in proper proportions a roof can be made as perfect and smooth as a schoolboy's slate. In my investigations, I have found that the law of definite proportions must be observed when mixing the tar and the flour. Tar two years old is much better than the tar just from the gas-works. Tar improves by age. The proportions should be different, according as the tar is old or new. If a little too much tar be used, or not quite enough, the roof will not solidify so satisfactorily as it will when the tar and flour are mingled in definite proportions. Another consideration which this roofing may have the benefit of is this. I have found that numerous roofs have been made of coal tar, sand, and gravel, and they have given wonderful *dis*satisfaction; and the failure, denunciation and dissatisfaction have all been heaped upon *Plastic Slate roofs*, when there had been no flour of slate employed. I have in mind numerous instances where people condemned Plastic Slate roofs after having attempted to make a satisfactory roof of coal tar and sand. Coal tar and sand are very different materials from coal tar and flour of slate. There is another point that I may state for the benefit of this roofing, touching its liability to color the water that is collected on it. I have seen many beautiful roofs in this city made of this material. I was on one very large building covered with Plastic Slate, the roof of which was and is now as smooth and free from cracks as one unbroken flagstone. When we were examining the roof on a large house, I observed the water standing in the eave-trough, and it appeared as clear as the water flowing from a mountain spring. Previous to my investigations I would not recommend this roofing to any one. But now I believe that, if correctly put on, the roofing will be as durable as time, and after the material has solidified, I do not think it will affect the rain-water any more that a roof of the natural Vermont slate, which is quarried out of the slate beds.

J. M. Allen stated that there have been failures in making Plastic Slate roofs; but such failures were attributable to a poor quality of tar, or to want of skill in mingling the tar and slate flour in proper proportions.

N. C. Meeker.—My brother has employed Plastic Slate roofing to a limited extent, and he thinks it requires much skill to put it on correctly. Still, he considers it, on the whole, a valuable roofing material.

Mr. Lawton spoke at some length on the superior advantages of shingles over all other materials for roofing.

The chairman of the Club stated that he had been unsuccessful in his efforts to make Plastic Slate roof. But he has so much confidence in that material that he would make another effort. He expressed a desire that the report of the committee should satisfy all inquirers about Plastic Slate, as its merits and demerits had been fairly presented.

We do really feel thankful to the Club for their patience in answering questions and discussing the matter for over two long years. It had become almost an annoyance, and took up the valuable time of the meetings, but we hope this action will settle the matter and relieve the Club.

We think everybody must thank the committee for their thoroughness in this investigation, and their impartial report, although they assumed the duty with perhaps a slight degree of prejudice against Plastic Slate in their minds.

JAMES M ALLEN, Secretary,
P. S. R. J. S. Co., 157 Broadway, N. Y.

The New Blasting Powder.

[From the Stockholder.]

The great importance of a thoroughly good explosive agent, at once safe, cheap and efficient, is coming to be understood by those engaged in mining. A new blasting compound—the novelty of which, however, consists rather in the mode of manipulating than in the materials—has been extensively used in the mines and quarries of Austria. It is called haloxylin, and appears to have given great satisfaction, both from the quality of work done and the manner of doing it. This new powder is not liable to spontaneous ignition, and cannot be exploded by percussion or friction. It will merely burn away in the open air, but when properly confined in the blast-hole it exerts an immense rending force. Its explosion sends off but little smoke, which is free from the suffocating character of ordinary powder smoke. One pound of haloxylin will occupy nearly twice the space of one pound of gunpowder, and as it does fully two thirds the amount of work, bulk for bulk, a material saving is effected. It is claimed that haloxylin has a tendency to cleave rather than to crumble rock, but as this is common to all slow-burning powders it may be passed over.

Haloxylin is composed of saw-dust, charcoal, saltpetre, and usually, ferrocyanide of potassium, although the latter article is sometimes dispensed with. The proportions in which these ingredients are combined are generally about nine parts by weight of sawdust, three to five parts of charcoal, forty-five parts of saltpetre and one part of ferrocyanide of potassium when that is used. The sawdust which should be made from a non-resinous wood, is passed through a fine seive, and then mixed with finely powdered charcoal (from light wood) and powdered saltpetre. The mass is moistened with about one quart of water to the hundred weight, and then stamped or crushed, by which it is rendered homogeneous. The mass is now moistened again with water, or, if a quick powder is required, with a weak solution of ferrocyanide of potassium. The process of caking, granulating and drying, are conducted in the same way as in the manufacture of ordinary powder. The Cronstadt Mining and Smelting Company made a series of careful comparative experiments in their Telek iron mines, and obtained, with half the weight of haloxylin, the same results as with the powder in general use. In the ironstone mines of Morawieza the experiment was made in less firm rock, with large bores, and a charge of twenty-five to thirty pounds of haloxylin produced an effect exceeding by one-third that of gunpowder. These experiments seem to show that the new compound has at least some advantages over ordinary blasting powder; and when the quality of blasting powder used in a large mining district is taken into consideration, it will be perceived that a saving of only 30 per cent. offers strong reasons for its trial.

Useful Recipes.

POLISHED STEEL.—Polished surfaces of steel and iron may be prevented from rusting by exposure to water if they are coated over with a mixture of lime and oil.

TO PRODUCE FIGURES ON WOOD.—Slack some lime in stale wine. Dip a brush in it, and form on the wood figures to suit your fancy. When dry, rub it well with a rind of pork.

KYANIZING BY STEAM.—It is said that while it costs about ninety cents each to kyanize railroad sleepers by steeping them in the liquid—the process ordinarily employed—the same thing may be effected equally well by means of hot vapor, at an expense not over 10 cents.

TO CLEAN MARBLE FIRE-PLACES.—Marble fire-places should not be washed with suds; it will in time destroy the polish. After they have been dusted, rub the spots with a nice cloth saturated with oil, then rub dry with a soft rag.

CLEANING MARBLE.—A correspondent says: It may be of some value to telegraph operators, who have marble-based instruments, and to housekeepers who have marble-top furniture, etc., to know that a common solution of gum arabic is an excellent absorbent, and will remove dirt, etc., from marble. First, brush the dirt off the piece to be cleaned, then apply with a brush a good coat of gum arabic, about the consisteney of thick office mucilage, expose it to the sun. In a short time it will peel off. If all the gum should not peel off, wash it with clean water and a clean cloth. Of course, if the first application does not have the desired effect, it should be applied again.

A NEW WEATHER-GUIDE.—Two drachms of camphor, half-drachm of pure saltpetre, half-drachm of muriate of ammonia, and two ounces of proof spirits in a glass tube or narrow phial, will make a very good weather-guide. In dry weather the solution will remain clear. On the approach of change, minute stars will rise up in the liquid, while stormy weather will be indicated by the very disturbed condition of the chemical combination.

The American Institute.

The regular monthly meeting of the American Institute was held on the 7th instant, Hon. Horace Greeley presiding. After the usual preliminary proceedings, Mr. Adriance, from the Financial Committee, reported the receipts and expenses of the Institute for the three months ending October 31, 1867, as follows:

Balance in the treasury July 31		$1,477
Receipts from various sources		14,229
Total		$15,707
Expenses of repairs to real estate	$4,083	
Expenses of library & miscellaneous	8,348	
		$12,432
Balance		$3,274

The report was accepted. The managers of the 37th annual Fair of the Institute, recently closed, show the unprecedented success which attended it:

Amount of money received and deposited		$39,067
Amount disbursed		19,352
Amount on hand		$16,714
Estimate of expenses not yet liquidated		4,714
Surplus		$15,000

The report was accepted.

After receiving the opinion of the Committee on Location for a site in which to hold the future Fairs of the Institute, which was referred to the Trustees, the meeting adjourned.

Artificial Ice.

M. Ballard has presented to the Academy of Sciences, for M. Carre, his new ice-producing machine. The principal agency in this machine consists of sulphuric acid, marking 59° to 65°, circulating in a thin stream, through which passes vapor of water, drawn along by a vacuum created pneumatically. The evaporation of this produces the cold. The recipient of the acid is formed of an alloy of lead and antimony, in the proportion of 5 to 6 per cent. It supports without alteration of form a pressure of five or six atmospheres, while in practice the pressure cannot exceed one atmosphere. The copper pump is preserved from the contact of the sulphurous acid, always disengaged by the acid, recently introduced, by an arrangement which necessarily and constantly oils the inside surface. The valves are opened mechanically, and cannot get deranged. The apparatus keeps the vacuum for several months; the acid is extracted when it has become diluted to about 52°; the congelation commences, generally, three or four minutes after the commencement of making the vacuum; if cold water, at 37.4° or 39.20° is required, two minutes suffice, and a little shaking up for some seconds restores the air which has been lost. Other substances may be used instead of sulphuric acid, such as caustic potash or soda, or chloride of sodium, which cause a congelation sufficiently prompt and intense. In the application, M. Carre mentioned the adoption on board ships and in cellars, where the temperature could be indefinitely kept at 41° or 42.8°, in all latitudes, also for the refrigeration of apartments.

M. Dumas is of the same opinion as M. Ballard, with regard to the success of the new ice machine, especially if sulphuric acid can be replaced by other substances more inoffensive; he indicated that over-dried bran, a powerful absorbent, might be tried, and requested M. Thenard to give his opinion, and to state what advantage agriculture would derive from this mode of producing cold. M. Thenard first called attention to the fact discovered by milk-women, and of which he could not find an explanation; if milk, a few minutes after being drawn from the cow, be cooled with very cold rain water, it keeps fresh for many days, and can be sent a long distance Carre's apparatus is advantageous to replace the cold water, especially in agricultural distilleries, which employ a great deal of sulphuric acid, and keep at the same time a great number of cows.—*Mer. Journal,*

A New Theory of the Gulf Stream.

In a new work entitled, "The Water Link of Europe and America," by Rev. C. W. Dennison, is the announcement of a new theory of the origin of the Gulf Stream. The author, noting the color of the water; its peculiar movement and disturbances; its mineral solutions differing from those of the surrounding ocean; its masses of foreign sea weed; and also taking into consideration the facts that the waters of the Atlantic are constantly pouring into the Mediterranean through the Straits of Gibraltar, that there are also twelve large rivers, including the Nile, continually discharging their tribute in the same sea, and that this sea possesses no visible outlet for the escape of these accumulating waters; in view of these facts the author says:

"The so-called Gulf Stream and other kindred currents are the natural outlets of the great water basin of the Mediterranean. The water of this sea, entering the earth by means of the vortex or water-caverns of Scylia and Charybdis, passes under the earth in a westerly direction, and comes out again on the coast of Yucatan, where the Gulf Stream is first seen. Here at once, in this distant ocean, its color, its eddies and vapors, all appear to view. The steady current here is the same as that at the Straits of Gibraltar. The color is imparted by the mineral elements with which the water comes in contact during its subterranean passage. Its heat is derived from its proximity to the interior fires of the earth. Its sedges are drawn in at the Mediterranean entrance, and collected on its passage through the vast caverns which underline this planet, and which may produce this sedge in abundance. Its gases come from the same subterranean source. Its eddies and whirlpools are caused by interior pressure driving up the warm water constantly into that which is colder. We, therefore, put on record, for the first time in this permanent form, this new theory—*the Gulf Stream is a subterranean water, mainly fed by the Mediterranean Sea.*"

Mining Share Market.

The San Francisco Weekly Stock Circular of October 26, gives the market rates of mining stock as follows:

Since our last reference the mining share market has been characterized by a good degree of activity, showing a considerable increase of transactions in the aggregate, and withal exhibiting more animation; however, the majority of stocks comprising the call list of the Board have depreciated materially from closing quotations of last week. Several private gold quartz claims, located in California, one of which (the Hayward) is quite extensive, and has yielded largely within the past nine years, have been incorpurated and placed on the market within a few days, full particulars of which will be found below.

Crown Point has been in considerable request, advancing from $805 to $910, and closing at $640 s. 10.

Ophir is dull of sale, a few feet commanding $37@30, and at the close $30 was bid.

Chollar-Potosi sold quite freely under a rapid decline from $209 to $152, then selling at $172.50, and closing at $163.

Hale & Norcross sold at $725@745 per foot early in the period under review, and at the close sold at $690 per foot.

Savage opened at $117, advanced to $129, and sold at $118.

Amador Mining Co. has been placed on the market within a few days, and sold yesterday at $215 per share. This is the celebrated Hayward mine. The bullion returns during the past two weeks show a yield of $16,580.

Yellow Jacket declined from $480 to $310, and closed at $342.50.

Gould & Curry is in somewhat better favor, having improved from $295 to $350, and closed yesterday at $330.

Overman has again become one of the active stocks on the list, opening at $64, rising to $62.50 s. 10 in the open board, and closing at $45.

Kentuck rapidly receded from $238 to $173, closing at $182.

Imperial was well maintained within a range of $127 to $131, and at the close $130 was bid.

Belcher opened at $115, then sold at 105@110.

Gold Hill Quartz realized $100 early in the week, and closed at $90.

The aggregate sales of stocks, legal tender notes, etc., at the regular sessions of the Board since Saturday last amounted to $1,067,421.

PATENT CLAIMS.

Pertaining to Gas, Mining, Petroleum, Water, etc.

71,002.—Gas-Heating Apparatus.—David G. Haskins, Cambridge, Massachusetts.

I claim, 1st, The combination of an air-chamber, A, constructed as described, with the ring, r, the perforated plate, B, and the air-supplying apparatus, R S S, or its equivalent, substantially as and for the purpose described.

2d, I claim the combination of the chamber, A, and the tube, D, provided with deflectors, and a plate or button, o, with a gas or vapor burner, substantially as and for the purpose specified.

71,150.—Holders for Lamp and Gas-Shades.—Chas. W. Emerson, Hartford, Connecticut.

I claim a holder for lamp and gas-shades, formed with the ring, *a*, wires, *b b*, and spring-ends, *e e*, over which the ring, *f*, of the shade, *g*, is passed and held as set forth.

71,233.—Apparatus for Manufacturing Gas and Oil from Coal.—John Shoemaker, Putneyville, Pa.

I claim, 1st, A retort for distilling bituminous coal adapted for application to an ordinary stove, in combination with a rectifier, B, pipes G and L, receiver H, vessel I, and condenser K, arranged substantially as set forth.

2. The combination and arrangement of the retort A, safety-valve E, rectifier D, constructed as described, with the pipe G, receiver H, vessels I, condenser K, worm L, and connected branch pipes, substantially as and for the purposes set forth.

70,712.—Apparatus for Burning Hydrocarbon Oils.—Matthew T. Gosnell, of Baltimore, Md.

I claim the combination and arrangement of a tube or pipes B B, a perforated hearth, C, a valve or valves or inlets, (for admission of atmospheric air,) D D, with a boiler A and furnace E, or their equivalents, in the manner and for the purposes set forth.

70,732.—Mode of Obtaining Motive Power from Petroleum and other Oils.—Robert D. McCreary, of Oil City, Pennsylvania.

I claim, 1. The process herein described of producing motive power from oil, without wholly destroying its lubricating or illuminating properties, or its value for refining or other purposes.

2. I further claim the combined procese of partially evaporating oil to obtain motive power, without destroying its valuable properties, and using the resultant gases for fuel or illumination after their expansive force has been or partially so spent in driving the engine.

FOREIGN.

70,704.—Mode of Producing Hydrogen Gas.—Cyprier Marie Eessie Du Motay and Charles Raphael Marechal, of Metz, France.

We claim the method of and means for producing or generating hydrogen gas, substantially as herein set forth and described.

70,705.—Mode of Producing Oxygen Gas.—Cyprier Marie Eessie Du Motay and Charles Raphael Marechal, of Metz, France.

We claim the method of and means for obtaining oxygen gas from atmospheric air, substantially as and for the purposes herein set forth and described.

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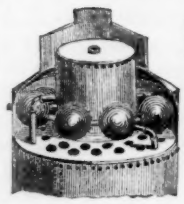

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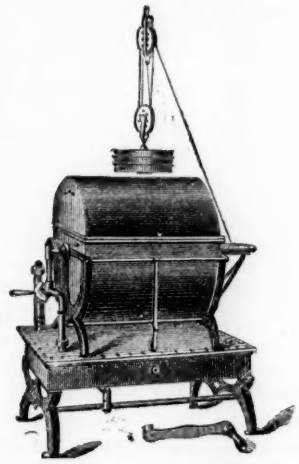
SOLAR GAS MACHINES.

For lighting Private Dwellings, Churches, Hotels, and Factories in any locality and independent of any Gas Company.



We manufacture eight sizes of the SOLAR GAS MACHINE, ranging from ten to five-hundred light capacity. Every machine is put in operation and fully tested before it is sent off, and is guaranteed to give perfect satisfaction. This new apparatus is the result of 15 years of experience in this special line of manufacture, and we feel warranted in asserting that our machine excels all others of a similar kind in the market. It is much simpler and more efficient than any former manufacture, and is constructed with special reference to safety and durability. There is no possibility of an explosion under any circumstances whatever, nor is the gas tank likely to leak or give out, or any part of the machine to get out of order, if reasonable care is taken of it. From five to fifteen minutes' attention is all that is required to keep any size of machine in perfect working order to supply all the burner-jets in a dwelling or factory.

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Gentlemen: I purchased of you, Nov. 18, 1865, one of your Solar Gas Machines, for my house at Auburndale; and from that time until the present, I have enjoyed uninterrupted success with it. The light is uniform, clear and steady, and the best I have ever seen. I have never experienced trouble of any nature from the machine, and consider it invaluable. As to its safety as compared with any other illuminator, I consider it far superior, and have discarded everything else in the shape of oil, fluid, kerosene, etc. Hoping your invention may prove remunerative, I remain,

Yours respectfully
W. E. PLUMMER,
53 Merchants' Exchange.

LAKE FOREST, ILL., Aug. 30, 1867.

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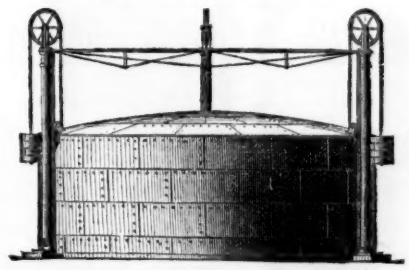

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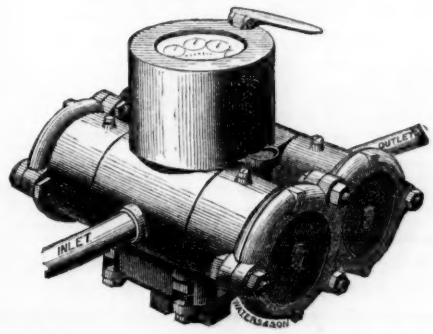

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Published on the 2d and 16th of Each Month

At No. 22 Pine Street, New York.

BRYANT, CALLENDER & CO.,

EDITORS AND PROPRIETORS.

MONDAY, DECEMBER 2, 1867.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

SUBSCRIBERS would confer a favor upon us by remitting CHECKS or POST OFFICE MONEY ORDERS, as we are frequent losers where money is enclosed in letters.

☞ NEWS AGENCY.—The American News Company, 119 and 121 Nassau street, New York, are agents for this Journal. Newsdealers will please send orders to them.

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Answers To Correspondents.

A. T., of PA.—Puddled steel is said to be at least twice as strong as cast iron. A preparation of India-rubber and cork has been used to manufacture carpets.

S. A. L., of N. Y.—There can be no lime or potash in steam. The purest water is obtained by distillation condensing steam.

N. A., of Mass.—Carbonic acid gas is heavier than atmospheric air. It is a mistake, however, to suppose it will form a stratum next to the earth. It cannot be owing to a peculiar property which gases of different densities have of mixing together.

S. B., of Mo.—To make brick work water tight use a cement made of linseed oil, red lead and fine white sand, or ground glass. One tenth part of lead to the amount of sand and sufficient oil to make it plastic. Lard oil is obtained by subjecting lard to pressure. It is not an artificial mixture.

AYUA, of Ohio.—Your aquaria, or fish tanks, may be made water tight with water lime cement mixed with a little boiled linseed oil. After a couple of weeks this hardens, but still is somewhat elastic. No better cement can be used.

J. G., of Ohio.—The party named was in New York about two years ago. His present whereabouts is unknown to us. The lamp was not a success and never came into general use. A large price was once offered for it, but not accepted, we believe.

O. S. A., of N. Y.—White varnish, containing a very little Paris white, applied to glass, will give it the appearance of ground glass.

To prevent the shrinking of wooden models apply a little linseed oil.

Coal oil treated with caustic alkali and then washing with warm water, will remove nearly all the unpleasant odor.

Matches are made by dipping in melted brimstone and then dried. Subsequently they are dipped in the igniting composition, consisting of gum combined with phosphorus.

ILLUMINATING GAS AND GASEOUS FUEL FOR COOKING, ETC.

The use of illuminating gas for cooking and heating, even at present prices, has many advantages over the common methods where wood or coal is used. Fire for cooking requires considerable time in preparation. Gas, on the contrary, is lighted and applied instantly. After cooking is finished with a fire of solid fuel, it is generally allowed to go to waste, or makes the kitchen disagreeably hot—gas is extinguished instantly as it is lighted, is much cleaner, and leaves no cinders, ashes, or dust.

When a moderate unvarying heat is required for pickling, stews, jellies, soups, preserves, etc., it is far preferable to coal. It only requires adjusting to the necessary heat, from which it will not deviate, and if required, will perform its office thus for hours without attention. It is particularly applicable to offices, workshops, and other places of business where persons find it inconvenient to go home to meals, and economical to avoid restaurants. It is useful to the early traveler to prepare his breakfast; he has only to light the gas and proceed to cook and eat it in the time ordinarily required to "build a fire." For sick-rooms, nurseries, and for heating water for the morning toilette, gas is almost a *sine qua non*. For heating churches, for making comfortable the chancel and vestry-room, for recitation rooms in an academy and schools, for reception rooms in our dwellings and other places which require occasional and immediate warming, gas is the most convenient means of heating, and often is as economical as continuous fires, even at the present rate of illuminating gas.

HEATING GAS.

That a cheaper gas than ordinary illuminating gas can be manufactured and distributed through pipes in the same manner, to be lighted and burned especially to produce heat in apparatus particularly devised for it, is a fact well known to-day by all scientific men who have investigated the matter at all. It is stated that this gas can be made for less than twenty-five cents per 1,000 cubic feet, but if it can be produced for twice or even three times that price, it is destined to produce a material change in the methods now employed to heat with solid fuel. It may not be too much to anticipate that before long all the inconveniences of coal stoves, heaters, ranges, etc., with their dust, dirt, and porterage of coal to keep them supplied will be done away with, and in their stead neat and ornamental devices for utilizing gaseous fuel will be employed, when it will be necessary only to turn a stop-cock in order to obtain a fire for any purpose.

This gas is formed by the decomposition of superheated steam in contact with incandescent coal in a peculiar manner. The oxygen of the steam (water) unites with the coal to form carbonic oxide gas, while the hydrogen is left free. Both gases are conveyed to the gasholder from whence they can be distributed at pleasure like other gas. Hydrogen, it is well known, when burned with oxygen, produces the most intense heat known. The oxyhydrogen blow-pipe is made on this principle. When hrdrogen is burned with atmospheric air a very intense heat is obtained, and in either case the products of combustion are simply vapor (water). The combustion of carbonic oxide gas has nearly the same heating effects that hydrogen has.

GAS MOTOR.

The introduction of the Lenoir gas engine into this country, whereby common gas is exploded in either end of a cylinder to propel a piston in lieu of steam, has shown the application of gas as a motor This is being introduced to give power for light machinery, but with hydrogen gas cheap enough there is no limit to its application as a motive power The advantages of simplicity and comparative cheapness of the parts of a gas engine, and its entire absence of danger by explosion when compared with a steam engine will be a strong inducement to its general introduction in due time.

CRYSTALIZED EGG.

The epicure of to-day, owing to the aid of science, has advantages in gratifying his appetite at a cheap rate which a few years ago he did not dream of—in fact, it may be considered that science and invention combined have so perfected not only the art of preparing perishable food, but of preserving it in its purity and freshness for long periods, so that when required it can be taken long journeys by land, or vayages by sea. The effect this must have upon the health and longevity, the physical and even intellectual perfection of mankind if it could be accurately determined, would be wonderful indeed. Preserved fish, flesh and fowl, etc, and also fruits and vegetables are now common and well-known; milk is also a later addition to our *conserves*.

But there is one important article of diet which has, until recently, baffled all attempts to render it capable of preservation in a pure state any length of time. This is the egg. A process has been discovered and patented by Mr. Chas. Lamont, whereby this indispensable article of food is so prepared that it can be kept for years without the least danger of change or decay.

Briefly, the process consists in emptying the fresh eggs from the shell into a long covered trough; a shaft, armed with a series of metallic discs about fifteen or twenty inches in diameter, is made to descend into this trough while revolving, which beats the eggs into homogeneousness, and covers the surfaces of the discs with a thin covering of egg. The discs still revolving are elevated from the trough and a current of hot-air passed through the covered box, which quickly dries the egg, when a series of scrapers are brought into action so as to scrape off the egg in the form of fine thin scales or granules, which have the appearance of being crystalized. This process may be repeated *ad libitum*, and thus is obtained a commercial article of prepared egg. This "crystalized" egg retains, perfectly, all the peculiar properties and flavor of the fresh egg, a result earnestly sought for by scientific men, but heretofore in vain. It may be used for all the purposes where broken egg is needed, and for cooking, such as omelets, cakes, custards, etc., by simply dissolving a little of the dessicatedegg in water and beating it as usual.

One pound of this material is equal to forty-four eggs, one hundred dozen eggs when crystalized occupy only one cubic foot.

This remarkable invention has been bought by the U. S. Egg Dessicating Company, No. 3 Bowling Green, New York, and is being successfully and rapidly introduced into market. We have tried the article in omelets, custards, etc., and found it to be excellent, and all that is claimed for it.

CAMERON COAL.

Since the article appeared in our last number in regard to this coal, we have received a note from engineer Jos. A. Sabbaton, a portion of which we give herewith:

"GENTS: I observe what is probably a typographical error only, in my analysis of the "Star" vein, printed in your last number. You have 4·84 cubic feet of gas purified by one bushel of lime. It should be 4841 cubic feet.

"You also say that it is a better coal than the best Cannel, Wigan or other coals. Surely you have been very much mis-informed as to the value of Wigan cannel. No coking coal I ever heard of equals pure Cannel. As a matter of fact, merely, it

should be stated that my analysis of the "Star" vein was made with selected samples shipped in bbls. It cannot be expected that the average run of the mine will give results equal to those obtained from selected samples."

Of course, there can be no question as to the superiorlty of pure Cannel as a gas coal, taken in that sense alone. We should have been more explicit, and have stated, perhaps, that *cost* and other things taken into consideration, the present tests would seem to make it the better coal for use here. That was the general idea we designed to convey when making the statement. We had no desire to detract from the real value of Cannel as a gas coal; and we are very much obliged to Mr. Sabbaton for calling our attention to the matter, It is our intention to make the Journal a reliable medium of information. If errors occur it will be from inadvertence or imperfect data; and it will be our province to correct any misstatement as soon as discovered.

HARDENING STEEL.

We give the following theory on hardening steel from our experienced contributor "Machinest":

Disappointment often results from using unclean water, especially greasy water. I would reject clean water if in an unclean vessel; perfectly clean water should be the rule. The reason why greasy water will not answer, when either grease or water will, is not generally understood. My theory is, that the grease floating on the water, first comes in contact with the article immersed and thinly coats it, and there being no affinity between the grease and the water, the heat is not conducted to and abstracted by the water with sufficient rapidity to produce a good result. Am I right? I ask any brother MACHINIST.

☞ MERCANTILE LIBRARY ASSOCIATION.—The forty-sixth annual report of this institution has been laid on our table, and from a glance at its contents it shows a very gratifying progress in all its departments. A large number of books have been added to the library within the past year, notwithstanding the increase in the cost of books, etc., etc., thus making the institution "rich in all that pertains to science, literature and art, and with open doors and widely extending and diffusing influence, they welcome to its portals the student, the scholar and the sage."

☞ Communications have been received respecting the proposed convention of gas engineers, which appeared in our last issue, but we are obliged to defer the publication of them till our next, having been received too late for the present number.

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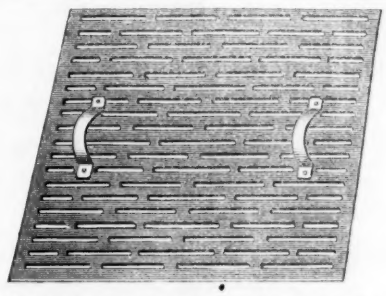

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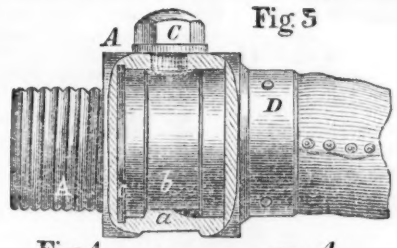


Fig 4

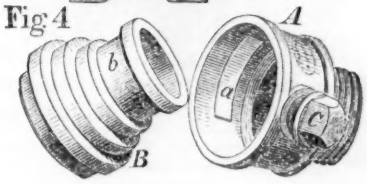
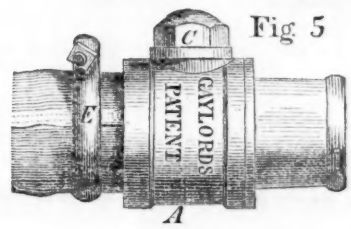


Fig. 5



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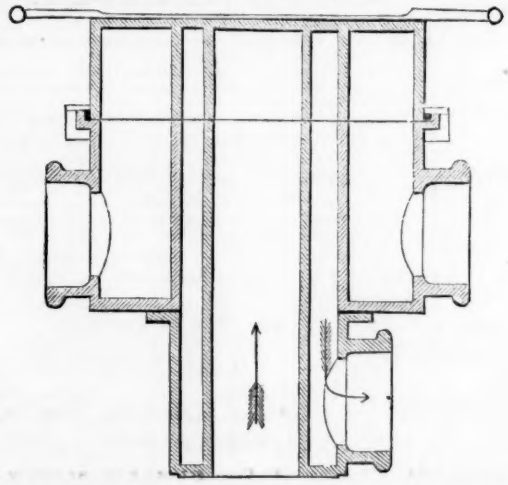

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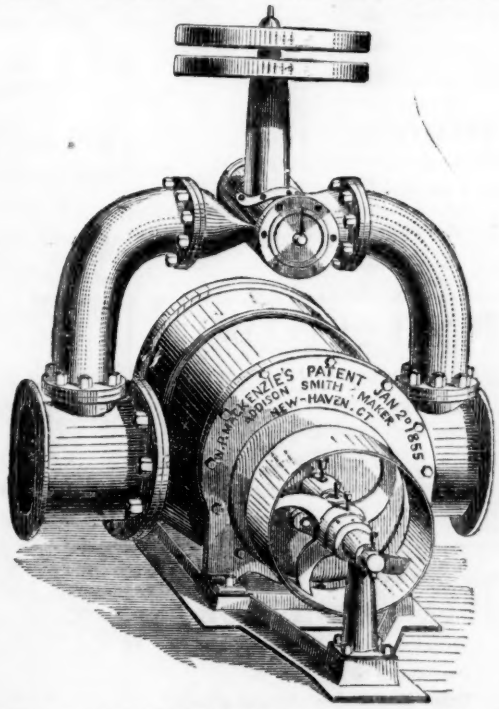

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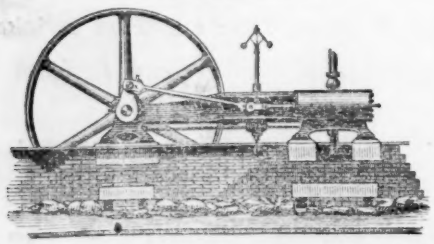

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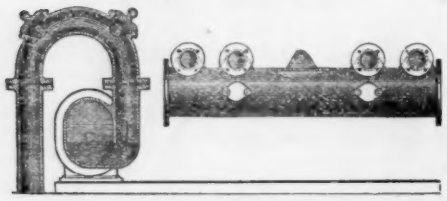

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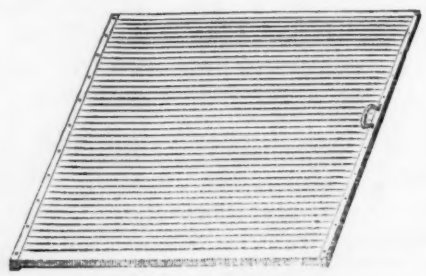

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Call and see for yourself before purchasing. Please bring samples of various kinds of thread (such as is usually found at stores), and various kinds of fabric, which you know the former most popular sewing machines either cannot work at all, or at best very imperfectly.

SUPERIORITY

over any other machine in the market will be seen at a glance:

1st. It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining, thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, make it equal, if not superior, to six machines combined; for instance, it binds, tucks and sews on the band at the same time, and in fact, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

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No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
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No. 3. Extra Oil-Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

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A YOUNG MAN, LATELY ASSISTANT MANAGER of a Liverpool Gas Works, wishes for a situation. Has no objection to the country. Understands all appertaining to Gas Manufacture, and can draw. Highest references. Apply to Col. ROOME, President Manhattan Gas-Light Co. 185

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With a Description of the Various INSTRUMENTS and APPARATUS employed in the

ANALYSIS OF COAL and COAL GAS.

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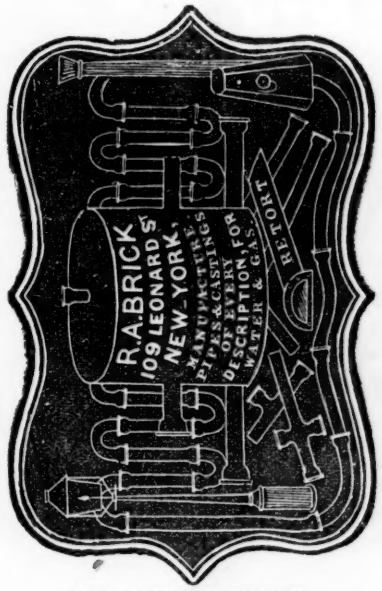

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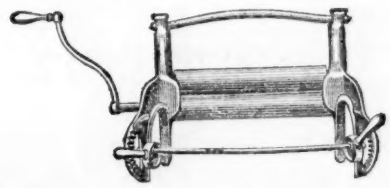
PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day

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That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

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That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*

That cog-wheel regulators are not essential.

That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

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PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

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Sample Wringers sent, express paid, on receipt of price.

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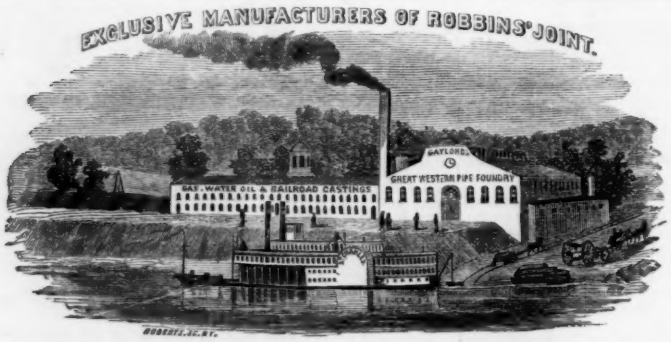

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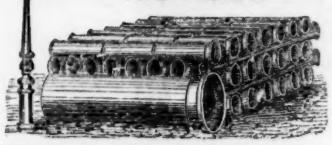

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New Family

SEWING MACHINE

Should be known in

IN EVERY TOWN.

To accomplish this at once and save the expense of a *Travelling Agent*, we offer thus, viz:

Any one sending us orders for two machines shall receive one machine free of charge. This proposition cannot avail after we have appointed a local agent in the town.

We have now completed our *new manufacture* at a cost of some $200,000—introducing *new patents*, and such important improvements, that without fear we are able to offer the following stringent guarantee, viz: After a fair trial, if any purchaser does not prefer the Finkle & Lyon Family Sewing Machine to any other, he can return it and have back his money.

This machine has taken many of the highest prizes; *is less complicated than any other first class machine; does a wider range of work without changing; requires no taking apart to clean or oil, no "lessons" to set needle, regulate tension or operate machine.*

Our new Manufacturing Machine is sold on the same terms as the Family Machine.

Please send for a circular with samples of sewing.

Finkle & Lyon S. M. Co.
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Great Impovrement

IN

Sewing Machines.

EMPIRE

SHUTTLE MACHINE!

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Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,

COMPLETE:

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No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

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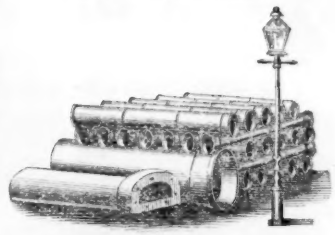

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All Pipe, &c., Made of the Very Latest Pattern and Improvements.

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Have been placed on the route to Savannah by the Atlantic Mail Steamship Company of New York, and are intended to be run by them in a manner to meet the first class requirements of the trade. The cabin accommodations of these ships are not excelled by any Steamers on the coast, and although their carrying capacity is large, their draught of water enables them to insure a passage without detention in the river.

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Sailing days from New York.

1867.

February 20th, March 10th and 30th.
" April 20th, May 10th and 30th.

And so on at intervals of twenty days, leaving on the Saturday previous, when a regular sailing day comes on Sunday.

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66tf D. N. CARRINGTON, Agt.

The Paris Gas Company have decided to manufacture alkaline sulpho-cyanides, and especially the sulpho-cyanide of sodium, on a large scale, at the request of the Photographic Society. The price will be three francs the kilogramme, and sixty tons can be produced yearly.

Nitro-benzine may be obtained nearly colorless, free from the unpleasant tarry smell which usually accompanies it, and in fact with a pure, fragrant odor by distilling it, much below its boiling point in a current of steam. The first portion of the distillate shouldbe rejected.

The Empire Shingle Machine.

This cut illustrates the Empire Shingle Machine, which the inventor asserts is the most perfect mechanical and expeditious machine of its kind now in use.

It cuts shingles, staves and box stuff with equal facility, superior to sawed, and equal to hand made.

This machine has a powerful knife moving in the upright ways as shown, which descends upon the block below with sufficient force to cleave a complete shingle from it at each blow or motion. The carriage carrying the block is moved one thickness of a shingle forward, after each motion of the knife, by a simple cam movement, alternating the thick end of the shingle from each end of the block in succession.

From the same blocks that saws 20,000 this machine will cut 30,000, an advantage of 10,000 shingles or pieces to every day's work. All kinds of timber, clear or knotty, straight or cross-grained, hard or soft, can be cut almost as smooth as if planed by hand, samples of which can be seen at the office of the agent.

It is adjusted for either steam, water or horse power, before leaving the factory. A single horse-power will drive it, and a workman of ordinary capacity can operate it, there being no complex machinery, and the agent guarantees, when properly worked, to make 2,000 good shingles per hour, or in default, will take back the machine and refund the purchase money. All the help required to steam the blocks run the machine and cut the shingles ready for packing is two good hands.

The blocks require steaming or boiling. This is a simple process and easily accomplished. Two boxes are made of two-inch plank, perfectly tight, each holding about one cord of blocks, they should be filled about one-quarter to a third full of water, then pack them full of blocks, fit and fasten down the covers and apply the steam below the water level, through a pipe connected to a short piece attached to the box, by means of a flexible piece of hose with coupling.

While the contents of one box is being cut the steaming of the contents of the other is going on; and so on alternately, which keeps up a constant supply. Some wood requires about two hours' steaming, very soft wood less and very hard more. All woods are improved by steaming. It extracts the acid, thus making it more durable, and seasons it in a few days, rendering it more valuable in whatever form it may be used.

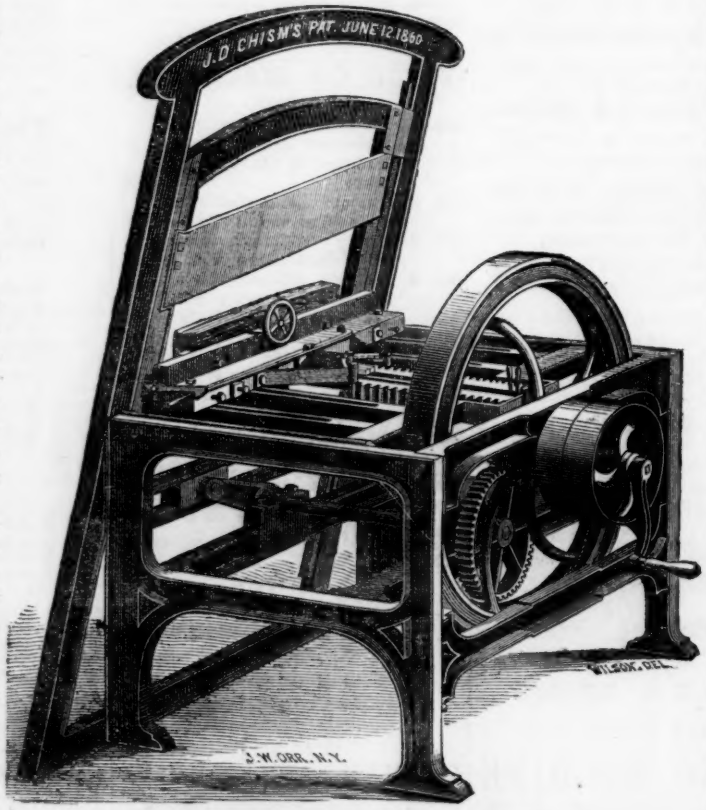
In case it is desired to operate the machine with horse-power a coil of iron pipe can be used to create steam, which is placed within a simple brick or stone structure, high enough from the ground to build a fire underneath, and retain the heat immediately around the coil. The whole pipe and structure may be put up at a very trifling expense. The waste timber from the blocks makes the best fuel.

The machines are built with such accuracy that any part of one machine will fit another.

Duplicate pieces of any part of the machine can be obtained, at any time from the factory in New York, in case of breakage.

A machine to cut twenty-four inches in length and under, with right of use, packed and delivered on board of boat or cars in New York city, will cost $500 and a machine thirty inches in length and under, with right of use, $600 cash on delivery. Unusual inducements offered to purchasers of territorial rights.

The "Empire" received the first prize medal at the American Institute held in New York city, in October, 1865; also the first prize medal at the New York State Fair, and diplomas from several of the New England States, in attestation of its superiority over every other machine, for accomplishing the same work—all of which may be seen at the office of H. B. Reeve, General Agent, 141 Broadway, N. Y.



THE EMPIRE SHINGLE MACHINE.

Friction of Water.—The friction of fifty square feet of surface on a vessel's side, which has been painted smoothly, is found to be about eight pounds at four nautical miles per hour; when the speed is increased to eight miles the friction is increased to twenty-five pounds; at sixteen miles the friction would be seventy-five pounds. Thus, when the speed is doubled, the friction is increased a little over three times.

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